The Pelvic Floor: What Effect Does Childbirth Have on Long-term Outcomes?

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OVERVIEW

Background for this discussion
Pelvic Floor Dysfunction:
- Pelvic organ prolapse
- Urinary incontinence
- Anal incontinence
- Sexual function

Pelvic floor dysfunction
- Common
- 11.1% women will have surgery for UI or POP in their lifetime, 30% will have a repeat procedure up until age 80
- Difficult to study - multifactorial and late onset with regard to epidemiologic risk factors

Mode of Delivery
- Recent topic of much controversy and debate
- NIH State of the Science Conference: Cesarean Delivery on Maternal Request (CDMR)
- Media Focus
- The Real Question: “What is the risk of a trial of labor?”
- Pelvic floor is just one consideration
Cesarean Section

- Rates have increased dramatically\(^2\)
  - 3\% (NEJM 1937)
  - 30\% (2005, US total CS rate)
- CDMR rate unknown

Problems with Current Data

- Retrospective
- Numerous studies identify parity as a risk factor for pelvic floor dysfunction but, do not address MOD
- Very little RCT data, pelvic floor outcomes secondary

Problems with Current Data

- Transient postpartum symptoms
- Findings (anatomic, radiographic, neurologic) often do not correlate with symptoms
Pelvic Organ Prolapse (POP)

- Risk factors from epidemiology
- Delivery/potential pathophysiology:
  - damage to levator ani muscles
  - damage to motor branches S2-4
  - stretching/tearing endopelvic fascia and/or ligaments

POPQ Examination Staging

Defined by most distal portion of prolapse
- Stage 0: no prolapse (\(<=TVL+2\))
- Stage I: >1cm above level of hymen
- Stage II: <1cm above and <1cm below hymen (\(-1\rightarrow+1\))
- Stage III: >1cm below hymen but (\(<=TVL-2\))
- Stage IV: complete protrusion (\(>/=TVL-2\))

Prevalence in General Gynecology Practice*:
- 0 (6.4) I (43.3) II (47.7) III (2.6) IV (0)

*Swift et al AJOG 2000
**POP - Epidemiology**

Stage 0(2.3) I(33) II (62.9) III(1.9) IV (0)

Risk Factors:
- **Definition 1(/>= Stage II)** - ↓education, ↑higher vaginal parity
- **Definition 2(leading edge)** - ↓education, larger babies
- **Apical** - only RF past history of heavy labor

4 WHI: Nygaard et al

**Surgery for POP Epidemiology**

- Risk factors/Retrospective:
  - increased parity, increased BMI, less likely to have cesarean section (CS), more likely to have vaginal birth (VB)
- Risk factors/Prospective cohort:
  - Parity strongest association (not MOD)
    - Para 1 - 4X↑, Para 2 - 8X↑

1Carley, 2Moalli, 3Chiaffarino, 4Rinne, 5Mante

**POP Effect of Pregnancy**

- POPQ on Nulliparous women
  - Non-pregnant:
    - 0 (42.8%) I (57.2%) II (na)
  - Pregnant (2nd and 3rd trimester):
    - 0 (9.6%) I (42.8%) II (47.6%)

O’boyle et al

**POP Effect of Pregnancy**

- POPQ Stage pre/post delivery
  - 36 weeks GA:
    - 0 (54%) I (20%) II (26%) III/IV (na)
  - 6 weeks PP:
    - 0 (20%) I (28%) II (52%) III/IV (na)

- 37% new prolapse, 15% more severe
- Proportion who developed a new, more severe or 2 stage increase was statistically similar between vaginal and cesarean delivery.

Sze et al
**POP**

**Genetic predisposition**
- Evaluation of 101 sister pairs (parous/nulliparous)
- High concordance among sister pairs:
  - Anterior 74.3%
  - Posterior 75.3%
  - Apical 91.1%
- Discordant: 80% parous were more severe

Buchsbaum GM Obstet Gynecol 2006

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**UI**

- ~50% women have transient UI during pregnancy
- 3 months post-partum:
  - Prevalence 9-31%
  - Incidence 7-15%
- Antenatal UI increases the risk of post-partum and long-term persistent UI (delivery mode not protective)\(^2\)\(^4\)

1 Nygaard, 2 Foldspang, 3 Hvidman, 4 van Brummen

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**UI - Delivery Mode**

**1 RCT**

- Elective cesarean vs TOL for breech:
- 3 months: UI significantly higher in TOL vs eCS group (RR 0.62)
- 2 years: No difference in UI rates

Hannah et al 2002, 2004
UI - Delivery Mode

Conflicting data
- No statistical difference in urinary incontinence rates in women delivered only by CS when compared to women with only VD (Faundes et al, McKinnie et al)

UI Parity/MOD

- ASSOCIATION OF PARITY:
  - Strongest correlation of parity in 20-34yo RR 2.2 (primiparous)
  - Severity not associated with parity

- MODE OF DELIVERY:
  - Prevalence: G0 10.1% CS 15.9% VD 21%
  - CS vs G0: OR 1.5 any; 1.4 mod/severe
  - VD vs CS: OR 1.7 any UI; 2.2 mod/severe

Rortveit 2001, Rortveit 2003

UI Parity/Age

- Nulliparous nuns have similar incontinence rates to the general population (Buchsbaum et al)
- Several studies show that parity disappears as a risk factor with increasing age (*Rortveit)

UI Genetic predisposition

- Similar UI rates in postmenopausal nulliparous (47.6%) vs parous (49.7%) sisters
- Twin sister pairs UI rates:
  - Nulliparous 24%
  - CS only 48%
  - >/= 1VB 67%

1 Buchsbaum 2 Goldberg
Anal Incontinence (AI)

- AI = fecal and flatal incontinence
- Prevalence:
  - 2-13% community dwelling adults
  - Increases linearly with age
  - 5-26% first year after delivery
- Epidemiologic studies vary: some show higher rates in women, others show no difference in rates for men and women

3rd/4th degree AI

- Incidence of 3rd/4th: 2.9-8%
- Long-term studies conflicting:
  1: Retrospective 30 yrs: no difference for 3rd/4th, episiotomy or CS
  2: 5 years after VB, increased risk of with 3/4 (2.3), subsequent VB (2.4)

AI: Effect of Subsequent delivery

- Bek 1992 Fynes 1999:
  - If persistent AI after first delivery - high risk (87%) of deterioration with subsequent vaginal delivery
  - If transient AI - high risk for recurrent and/or persistent AI after subsequent vaginal delivery
- DeLeeuw 2001, Sze 2005
  - No difference

1 Nygaard 2 Pollack
**AI Delivery Mode**

- No difference in AI rates based on delivery mode:
  - MacLennan 2000: No difference based on delivery mode
  - McKinnie 2005: No difference in CS only vs at least 1VB
  - Hannah: No differences at 2 year
  - Lal 2003: CS 5% vs VD 8%; no difference in prelabor vs intrapartum CS

**AI - Genetics/Pregnancy**

- No statistical difference in AI for VB or CS after initiation of labor

**Sexual Function**

- Operative vaginal delivery increased risks: delay resumption of intercourse, dyspareunia, sexual problems, perineal pain
- Conflicting findings for VB vs. CS: some show no difference, others less dyspareunia with CS
Sexual Function
Genetics/Parity

_nulliparous women reported improved sexual function compared to parous women (regardless of age)
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- No difference in sexual function:
  - mode of delivery
  - operative vaginal delivery
  - episiotomy

Botros et al 2006